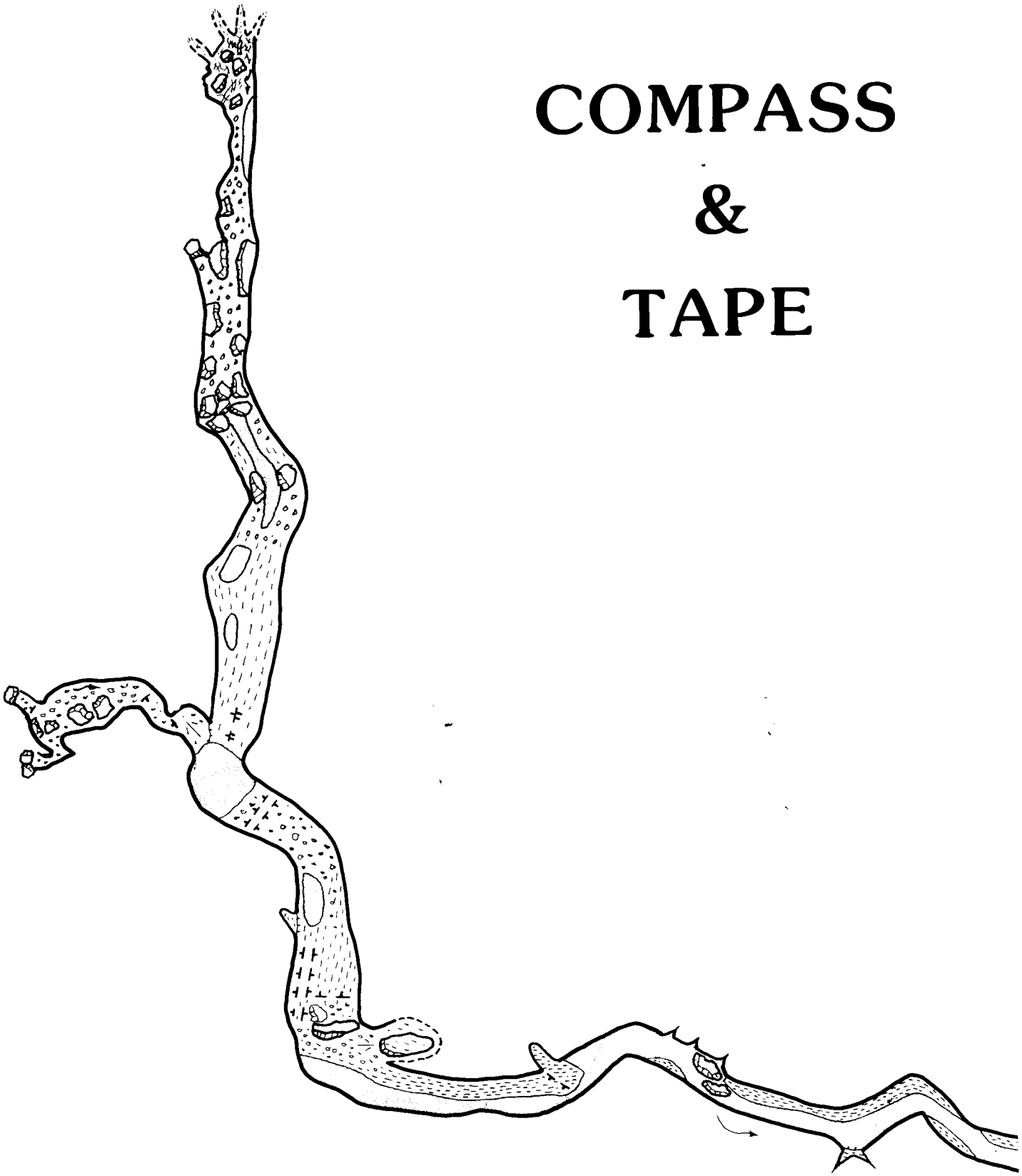
COMPASS & TAPE



Volume 3 Number 3 Winter 1986

COMPASS & TAPE

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COVER: The editor has taken to butchering his maps again for cover illustrations. This time it's a piece of Chick Cave, Logan County, Kentucky. Please send material (maps, drawings, etc.) suitable for publication.

Contents

From the Editor

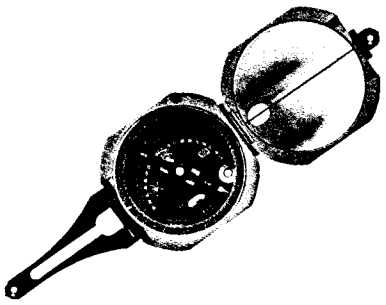
In the last issue of C&T, Mike Futrell crossed a threshold in symbolization-- into the realm of interpretive mapping. In making maps, as well as any other discipline, this places one in the role of decision-maker, with credibility on the line. **Tyler Groo** thinks that this may not be a very good idea, because it implies that ethical questions have been considered, and a decision reached. Regardless of one's stand on the conservation issue, interpretation brings on the old problem of one caver's dig being another caver's tight spot. I've seen enough cavers scampering through, up, over, or around their OWN mis-interpretations to keep my opinions to myself and go for graphic representation.

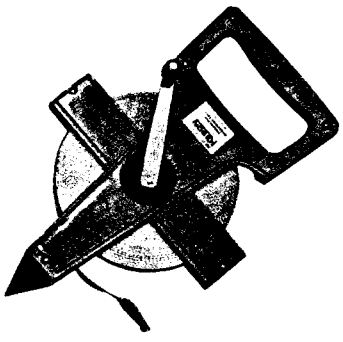
Can we judge a map without judging a cave ? This question may occur to you after reading **Doug Medville's** article. Some would suggest we must try: we are a small society and everyone knows what everyone else is up to--the judges go caving with the entrants!-- so no bias may intrude when we decide which of our friends has the BEST map. Yet the novelty and excitement of a good cave-- THE BIG NEW FIND --are at the heart of organized caving. Can judges remain unswayed by a cave which captures their fancy? Particularly when they are butchers and bakers... but not cartographers? Can a perfect map, one that captures every nuance, the very soul of a cave, be expected to win something...if the cave is ten feet long? And how does a hobbyist cartographer, having many "perfect" maps, choose which ones to enter? Perhaps it is not so surprising that competitive exhibitions of maps do not exist outside of caving.

Keith Wheeland summarizes the state of satellite location systems, present and on the horizon. (This article was supposed to appear in the last issue: it was even referenced on page 50.) You might wonder why anyone would use such expensive devices instead of conventional surveying, and who could afford them. But put yourself in the shoes of an engineer 40 miles offshore in the North Atlantic, with a $5 million oil platform being pushed by a couple of tugs costing $1000 per hour to operate, and the economics become attractive! Now what cavers need to figure out is how to borrow these devices.

The **Cascade Grotto** has been in touch with the **U.S. Geological Survey** regarding cave entrances on topographic maps. One can understand the USGS position: their job is to map the country and any concessions to groups having a special interest are risky. Imagine a mining firm requesting that stripped areas not be shown because they are an "attractive nuisance." The official position is that only caves which are being managed are shown. This seems fairly reasonable, since many small and obscure "things" on the landscape become mappable when humans take a specific interest in them. But the policy also seems a bit wavery, and apparently leaves a lot to the discretion of those compiling the maps. Bear in mind that the USGS archives the majority of publications on caving in the U.S., thanks to the NSS's very beneficial exchange program. Do we, as contributors of this obscure information, have the right to some say in how it is used ? An interesting question ... Any comments?

John Ganter, Editor





The Mini-Compass

by Bob Salika
Brookfield, Illinois

In the last year there has been a lot of discussion in C&T about various compasses, like the Brunton and the Suunto. One compass that I have never seen mentioned is the Mini-Compass.

The Mini-Compass is about 3 1/4-inches in diameter and 1 1/8-inches thick. It is liquid damped and is sighted with the aid of a prism. It has a tritium light source that, so far, has lasted the 8 years that I have had mine, and it is replacable. There is a rubber collar around the compass that makes it look like a mini-truck tire.

One of our members (Windy City Grotto) is working on a geological survey and, several years back, got a deal on buying a quantity of these French-made compasses. I got one, and a Suunto clinometer, and have been using it ever since. Several other members of our grotto like them too.

I have found that if you are sighting on a small target (such as a lamp flame over a station) that it is easy to read to one-quarter of a degree, or at worst, one-half a degree if your target is larger. You take a reading by sighting simultaneously over and through the prism. This means that the compass can be used in very close quarters. You need only to be able to hold the compass level with your eye to both sight and read the scale, so if you can raise your head enough to see where you are going, then you should be able to use the compass. I have found the compass to be small, well-built, easily read, low-maintenance, fog-resistant and reasonably priced.

We originally got the compasses from Goldberg Marine, but they no longer carry them as such. They do list a "Goldberg Special" that for all intents and purposes seems to be identical, for about $65.00. Whether these are just Mini-Compasses with Goldberg's name on them, I can not tell.

I have found another source: in the the E & B Marine catalog the Mini-Compass is listed at $84.88, effective through 1/6/86. See the illustration included. I am not aware of what other sources are available. But if you check around at good camping/boating shops, or places that handle surveying equipment, then you may find them available nearer to you.

If the availability problem can be overcome, then I think this Mini-Compass will be a pretty good buy for the serious cave surveyor. I, for one, will look forward to comments on this compass and critiques on other kinds of equipment used in cave surveying.

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980 Gladys Court
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STOP PRESS * * * * * * * * * * * * * * * * *

Bob reports a price of $79.95 (+ shipping) from West Marine Products, 2450 17th Ave., Santa Cruz, CA 95063-5189. Orders: 1-800-538-0775. They also stock tritium-illuminated Suunto compasses for $49.95 (+ shipping). This is the best U.S. price that I know of. - Ed.

A Comment On Passage Termination Symbols

by Tyler Groo
Paulina, Oregon

I'd like to bring up an argument against Mike Futrell's proposal [C&T, Vol 3:2, Fall 1985, p.49] which he overlooked in suggesting that cartographers include some new symbols at passage terminations.

I believe that a decision to physically alter a cave in order to gain, or improve, access is an extremely important one. The decision is irreversible and frequently controversial. In most cases it should be a very difficult decision because of the ethical conflict between our desires to both explore and preserve a fragile piece of underground wilderness. While it may not have been Mike's intent, use of his symbols presents the impression that the decision to pursue a particular lead by force has been made, and that independent efforts in that direction will be generally accepted by the caving community.

I believe that most "access enhancement" projects should only be undertaken after much careful consideration, and with a consensus of as large a group of cave-oriented participants as possible. This kind of decision will represent the "best" choice ONLY if it takes place after a survey is well underway (substantially complete in smaller caves), with maps and other collected information available to help weigh the benefits of developing a particular access point against the actual or potential adverse effects of modifications to the cave environment. A survey team, with the concurrence of the cartographer, is only equipped to make that decision unaided under the most exceptional circumstances (personally, I can't imagine those circumstances, but there's a lot I havn't seen.)

A cartographer relies very heavily on information provided by the survey team in his/her portrayal of a cave in general, and passage "terminations" in particular. I agree with Mike that many maps have serious shortcomings in their presentation of potential leads. Cartographers need to improve their presentations and PERHAPS develop some standardized symbolism. Surveyors need to be instructed in careful gathering of complete, accurate and useful information at unpenetrated leads: actual passage measurements and sections at the point of furthest penetration; size and composition of wall, floor and ceiling materials; air and water flow characteristics of the lead; careful description of the unpenetrated portion of the passage (or lack thereof); and an evaluation of other observed obstacles and possible solutions- to the the best of their ability. The cartographer can use that information to determine how to best portray the lead for the purposes of the map's inteneded audience. We will never be able to present, on a map, all the information needed to prioritize leads, or to make decisions to pursue leads by extraordinary means.

I suggest that maps be used to represent physical characteristics of the cave being illustrated; that Mike's symbols be used only to portray actual or planned excavations sites that have the general agreement of the caving community likely to be active in that cave; and that potential excavations be described by, and evaluated from, detailed lead lists developed from survey and exploration notes in conjunction with the most current mapping.

Note To Readers

Bound Copies of Volume 1 (1983-1984) and Volume 2 (1984-1985) are available for $4.00 each from the Treasurer.

Scaling and Units of Measurement In Cave Mapping

by John Ganter

In browsing through large numbers of cave maps and descriptions, and working out on the karst with various cavers, I've come across some instances where people are having problems in grasping and applying ideas of scale. We can communicate clearly about caves only by having an understanding of scale, the units of measurement often used to convey it, and some basic conventions. What follows are some observations, mostly of things to avoid.

Numerical Scales

Have you ever seen a map with the scale expressed only numerically, as a "Representative Fraction" ? For example, 1:212. If so you have probably been annoyed. Does the cartographer expect you to pick up pencil and paper to figure out that, let's see: 1 inch equals 212 inches in the cave, divide by 12 inches per foot, etc. I think you'll agree that this is a bad practice, but it occurs. Almost as bad is a map which only includes a statement like, "One Inch = 25 feet." In this case the cartographer is forcing the map user to find a ruler, place it on the map, and interpret the map scale. Why not simply put a graphic, or bar, scale on the map and save everyone a lot of trouble? The other advantage to a bar scale is that when the map is enlarged or reduced the scale changes accordingly. If only a numerical scale is included, it will be inaccurate and the map user will not be able to determine the proper scale without a copy of the original-sized map.

Of course, if you think that your audience would be interested in knowing what scale you drafted the map at, then include a statement indicating this: "Drafting Scale = XXX per YYY."

Mixed Units

One funny thing that I have been coming across occasionally is a scale given in mixed units, e.g. "Meters per Inch." At first I thought this was some new fashion, and considered scaling my maps in "Lightyears per Furlong." Then I realized that the problem was simply cavers trying to be good *Scientists* and using metric units, but having only inch-graduated paper to do their plotting on. Indeed, this is a problem: in the U.S. about the only kind of paper you can get with a centimeter grid is 8.5 by 11-inch graph paper. Obviously, this is not very satisfactory in size and durability for cave map drafts. I believe that good vellum metric grid paper is available from the larger suppliers, (e.g. K&E), but it may be very difficult to obtain. Why? American engineers and architects, in their bliss, never use it.

So the cavers who are trying to be scientific are coming up with very strange representative fractions. For example, their scale might be 8 meters per inch. A little cross multiplication shows us that:

$$\frac{8 \text{ meters}}{1 \text{ inch}} \times \frac{1 \text{ inch}}{2.54 \text{ centimeters}} \times \frac{100 \text{ cm}}{1 \text{ meter}}$$

$$\frac{8 \text{ meters}}{1 \text{ inch}} \times \frac{1 \text{ inch}}{2.54 \text{ centimeters}} \times \frac{100 \text{ cm}}{1 \text{ meter}} = \frac{800}{2.54} = \frac{1}{314} = 1:314$$

I don't see what the advantage is: one of the main reasons we use metric units is the clean representative fractions they give us. For example, a scale of 3 meters per centimeter can be mentally multiplied by 100 (i.e. the decimal moves two places to the right) yielding a scale of 1:300.

My suggestion is to use inch-graduated grid paper, draw the map at a similar English scale (say, 25 feet per inch instead of 8 meters per inch) and, finally, include a metric bar scale on your finished product. It's very simple: you know that 10 meters is about 33 feet, so you just put a mark on your feet scale at that point, then at 66 feet, and so on. Then you draw the meters scale, with those points marked 10 meters, 20 meters, and so on. Since the map has an even representative fraction (e.g. 25 feet per inch= 1:300), you can also at this point switch completely back to metric, with 1 centimeter on the map representing 300 centimeters in the cave. Following this procedure has allowed you to use standard grid paper and create a map with an even representative fraction-- at least until it is reduced. But when that stage is reached, it will have one or more bar scales on it, so it doesn't matter.

Having said all this, I might point out that it is becoming largely irrelevant. More and more people are using computers to actually plot their survey traverses, so there is no need for grid paper. The strictly-metric Association for Mexican Cave Studies, for example, just drafts on the plain 30-inch (!) paper that comes out of their plotter.

Choosing Units

I'm certainly not going into the old English vs. Metric System debate. The reason is that I don't care: I can understand either. The common sense approach is to simply include bar scales in both units on your maps. In this way the map is easily understood by all cavers... and don't assume that because you publish maps for your caving friends in the American Heartland that they are not seen by others.

There is really no need to survey caves in units which may be unfamiliar, nor should you throw away your survey equipment. Conversion to metric can be easily accomplished on the drafting table, as discussed above.

An observation on equipment, specifically using metric or English calibrated tapes in muddy conditions. The first thing you do with a muddy tape is to clean the spot at the reading. This gives you the fraction. Then you must find the nearest whole unit. Due to the way in which tapes are labelled, this involves searching either 1 meter of muddy tape, or one foot. I'll take the one foot, thanks.

Human Scaling

There is yet another type of scaling, one which uses not standardized units of measurement, but objects with which we are familiar. The two are complementary; they work together to tell us how large things are. We would not try to tell someone that a cave is so many "person-lengths" long or deep: some fixed measure is needed. So we have standard units, like the meter and foot. At the same time, it is difficult to "see" these units. Think about it, when was the last time you actually SAW a meter? If you're like me, it was probably the last time you unwound a survey tape. But we see people and things every day- we KNOW, in many senses of the word, just how big they are. So it makes perfect sense to include people, trees and other features in the overall design of a cave map. This is particularly valuable when a large pit or other space is being depicted.

Other Comments

1) I have never seen an automobile yet that has an odometer calibrated in kilometers. So please, U.S. cavers, give me road logs, and directions to that 150 meter pit up around the bend, in miles and tenths, as well as kilometers. Canadians, Mexicans and other civilized folk are excused-- I'll convert.

2) If you are giving a lecture on caves, try to choose one system and stick with it. Mixtures like, "It was a cool day in the 70s, so we drove a klick or two down the road, dropped a 476 foot pit with our 200 meter rope and surveyed 3000 feet of passage", drive your audience nuts.

Pinpointing Cave Locations By Satellite

by Keith D. Wheeland
State College, Pennsylvania

There is a company which is well on its way to providing a service for sending and receiving messages wherever you happen to be in the US. The system will use three satellites in synchronous orbit. (The first satellite is scheduled for placement in early 1986.) In addition to sending and receiving messages, the system will be able to determine your location to within a few feet.

Imagine standing at the entrance to a cave, punching a few keys on the hand-held GEOSTAR unit, and getting back a display indicating your location. The information I read (in a recent Popular Science) did not indicate how the location would be referenced. I assume that whatever units are used could be converted to latitude and longitude - if that's what was wanted. The other bit of information which was missing was the cost. Perhaps a frugal user could get a location fix at the same time they sent a message. How about, "Hey Mom, I'm out of the cave, I'll be home sometime! Oh, and GEOSTAR, where am I?"

This technology has been around for a while, but at present is expensive and fairly bulky. Texas Instruments (TI) will sell you a system consisting of three main components: the satellites, the control stations, and a light-weight, portable user station. The satellites and control stations form the Global Positional System (GPS), which is being developed by the Department of Defense: availability may change without notice. The control station sends data to the satellite and the satellite re-transmits data, including its position and a time signal. The ground unit sold by TI receives and processes the data. The processing can occur at once, or the data can be stored and processed later.

If you only need accuracy to within 14 meters, you can get by with one ground unit. The data will be received, processed and the location displayed on the unit. The cost for this package is about $140,000. The method which produces the highest accuracy uses two ground units, one at a geodetic benchmark and the other at a site to be located. The ground units collect simultaneous data which are stored on dual cassette recorders and processed later. In this way it is possible to get millimeter accuracy.

The cost of this option is about $335,000. This includes two ground based units, cassette recorders, microcomputer hardware, and software.

So you see, high tech can help pinpoint those elusive cave locations - for a price.

[Assembled from articles in the NITTANY GROTTO NEWS, Vol 32:4, August 1985, p. 5, and Volume 33: 1, January 1986, p. 10.]

[See also "The Alabama Cave Survey," C&T Vol 3:1, Summer 1985, p. 19.]

A Loss of Direction

Colorado-caver Donald Davis has opined that his wrist-compass-and-pace-based sketches of various caves are nearly as good as subsequent survey efforts. (See "Rebuttle to Medville," C&T Vol 2:3, Winter, 1985, p.55.) But judging from the announcement below (which appeared in ROCKY MOUNTAIN CAVING, Volume 2:3, Summer 1985, p. 22.) Donald may be be in trouble:

LOST: Military wrist-compass in Fixin' To Die Cave or at Extravaganza Campground over Fourth of July. Olive green plastic and metal case with wrist straps. Please return to Donald G. Davis, 5311 309 Rd., Parachute, CO 81635. Would also like to buy same if anyone has one to sell.

Cave Locations and the U.S.G.S.

The following exchange of letters recently occurred between an NSS grotto and the United States Geological Survey.

--\ It has come to our attention recently that the Provisional 1983 Series of topographic maps for the State of Washington include many sensitive cave locations. As an affiliated chapter of the National Speleological Society, it is our desire to protect the biological and geological forms that are present inside the caves of Washington. As such, we would like to request that you remove some of the more sensitive and less well known caves from the final edition of this map series. [Paragraph listing specific caves deleted.]

Over the years, we have worked with many state and federal government agencies including the Forest Service, National Park Service, and BLM [Bureau of Land Management] in order to preserve and protect these caves from further senseless vandalism. Obviously, there are many other quadrangle maps in this series here in the State of Washington and throughout the entire U.S. that have cave locations printed on them. It is our desire that it become the policy of the U.S.G.S. to eliminate the printing of cave locations, with the exception of commercialized or tourist caves which are well known and protected by their owners.

We would appreciate knowing the policy of your office and the U.S.G.S. in general regarding this particular matter. We would like to work with you in formulating a policy concerning this subject and welcome any suggestions you may have. We look forward to hearing from you at your earliest convenience.

Larry McTigue
Cascade Grotto, Seattle, Washington

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--\ In response to your letter of October 21, 1985, we have reviewed the material relating to the caves shown on [the 7.5-minute quadrangles you specified.]

The U.S.G.S. shares your concerns regarding the environmental effect of depicting caves and archeological sites on the national topographic series. We have sought advice from professional societies, state, and national agencies on this matter. As a result of these contacts, our accepted practice is to show protected and managed caves on topographic maps produced by the USGS. We believe that the selected omission of natural features on topographic maps would raise questions as to the completeness of other map detail.

We will further evaluate your request when the maps are revised or reprinted. We welcome your comments and hope you understand our position on this matter.

J.R Swinnerton
Chief, Western Mapping Center, U.S. Geological Survey

(from THE CASCADE CAVER, Vol 24:8 & 9, August-September 1985, p.55-56.)

[See also "Caves & Archeological Sites," C&T Vol 1:3, Winter 1984, p.35 for a statement of USGS policy on this matter. <<Ed.]

A Response Concerning the 1985 NSS Map Salon

by Doug Medville
Reston, Virginia

Having just read Carol Vesely's article in the Fall, 1985 issue of Compass & Tape about the judging of the 1985 Cartographic Salon at the Kentucky NSS Convention, and as a judge at both that Salon and a previous one, I would like to respond. She begins by saying that there were a number of complaints. So far as I know, her complaints were the only ones, although she complained enough for 20 people.

The judging session, as she pointed out, was too long: we did take over 4 hours. Considering the quantity of maps and the overall quality of the entries (generally high), this amount of time is required for a conscientious job to be carried out. A variety of criteria are used to judge the maps entered: technical quality (e.g. is the inking uniform, are the line thicknesses the same, are letters in the words aligned properly, etc.), overall appearance of the map (that is, what is its visual impact), and, layout (how are the elements of the map assembled: is the title block squeezed into a corner, for example.) These are the criteria that Ernst Kastning (who actually runs the Salon) asks us to consider in judging. I also look at how well the map communicates; that is, can you understand what it is that the cartographer is trying to portray? This is an important consideration, especially when the map depicts unusual situations or where non-standard symbols are used. In the case of sea caves, for example, the cartographer is trying to show some fairly complex relationships between free standing pillars of rock in the ocean, archways, alcoves, caves, and the mainland. This can be tough to do and when well done, as it has been by Carol and others, these maps win awards.

As Carol noted, I suggested having the judging done in two sessions; one to take a cut at separating out the winners from the rest, and the other to compare the winners and decide on the awards. Conventions are very busy places, and blocking out two sessions of perhaps over two hours each for map judging will not be easy but perhaps it should be tried. Carol is correct about needing feedback both from the written comments and from the judge's statements at a post-salon workshop. The reason for not having sufficient constructive criticism in the written forms is the same as the judge burnout problem: insufficient time. Ernst is the person who fills out the written forms- he tries to summarize the three judge's comments about the maps as they look at them, and with almost 40 maps to write about and the limited time, it is hard to capture the nuances of the judge's concerns. Perhaps with more time available, more can be written. As it is, we go through the maps twice: in effect, having two sessions within a session. In the first pass, we try to separate out the obvious losers and in the second, to give careful consideration to the remaining maps. Trouble is, by the time we get to the second pass, we've been at it for a couple of hours. It's at this time that our critical senses should be most keen; we're talking now about comparing some really good maps. Instead we're getting worn down and both the written comments and perhaps the quality of the judging suffers. Remember, this is being done at the end of a day of activities, we're missing dinner or whatever (I left my wife stranded at the Lexington airport because of the time involved in judging) and we don't want to miss the evening's activities.

One problem, at least this year, was that the maps weren't put up until almost the time of the judging. As a result, there wasn't time to have two sessions. I would strongly suggest that, in the future, the maps go up as soon as possible and that the judging begin early (like on Monday afternoon, when things tend to be less hectic). Then, if the judges want to take a break, they can do so and return to the judging at a later time. I would also suggest that the judges be selected early. Ernst asks people to be judges (or they volunteer) during the Convention. It would be better if this were to be done prior to the Convention so that the judging could begin earlier than it does at present

I don't have any comments about the number of awards given out. As Carol noted,

over half of the entries won an award. Unless we are given some guidelines (e.g., no more than 25% of the maps receive an award), this will continue to happen, especially if a lot of good maps are received. I think that Carol has some good suggestions about different ways of awarding ribbons and, in particular, I like her idea of awarding points for meeting each of the judging criteria. Ernst should also write down these criteria and post them near the maps. This may make it easier for people to see why certain maps received awards and others did not.

Finally, I want to respond to Carol's comments about judging maps, not caves. I should point out that her map of the Shell Beach Caves received a blue ribbon, which is a pretty good award. She seems to think that the reason that it didn't receive the medal is because I didn't think that it had a nice shape to it. Come on!

My comment at the Survey & Cartography Session about nice shapes to caves was made on Wednesday morning, before the judging, and had absolutely nothing to do with her entries that year. At the time, I didn't even know that I was going to be a judge and hadn't even seen any of the maps since they weren't put up until later that day. I thought that my comment was valid; some caves do have more aesthetically pleasing shapes than others and this could influence a judge's decision in a map salon. Remember, for better or for worse, overall visual appearance is a criterion. We (three judges; not just me) felt that Carol's map of the Shell Beach Caves was technically perfect, and for that reason it received a blue ribbon. As I recall, there wasn't a lot to the caves themselves- the map was an excellent portrayal of the relationship between several sea caves and the surrounding area. Her statement that I said "Well, they're just a bunch of sea caves and you can't really expect them to win" and that the medal-winning map won because it has a "nicer shape" is bullshit. If I really believe that, then I have no business being a judge. Surrounded by 30 or so people including several who didn't do as well as she did, trying to defend the decisions of the other judges, and harassed by sweet little Carol, I was probably less tactful than I should have been.Of course, I would expect a good map of sea caves to win in a cartographic salon: they've won several blue ribbons, and, I believe, at least one medal in the past. So what's she complaining about? EXCUSE ME, Carol, for having the nerve to disagree with you; EXCUSE ME for not giving you a medal! YOU be a judge next year!

The medal winner (Corinth Church Cave), won not because of its nice sinuous stream passage, but because of crisp graphics, good layout, and innovative use of transfer film to show pools. If it makes Carol feel any better, we debated the award for quite awhile, and the vote was two to one for the winner. A different set of judges could have voted a different way and her map could have been the medal winner instead. I can understand her frustration at not having won the medal when we really had nothing negative to say about her map. What it came down to was that Ganter, on the Corinth Church map, tried some new techniques which, we felt, worked. There wasn't anything wrong with Carol's (or the other finalist's) map: it was simply that we saw a little something extra in the winning map and that tipped the award. It's a subtle thing and hard to put into words on a written evaluation.

That's about all that I have to say on this subject for now. In real life, there are not always clear cut winners and losers. We did our best, and as I wrote above, next time around, perhaps Carol should be a judge and see how straightforward it is to pick the winners.

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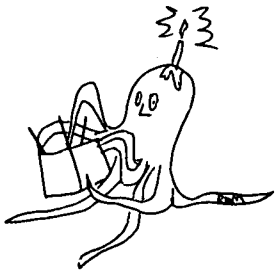

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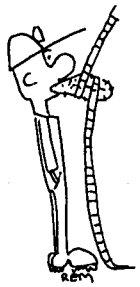

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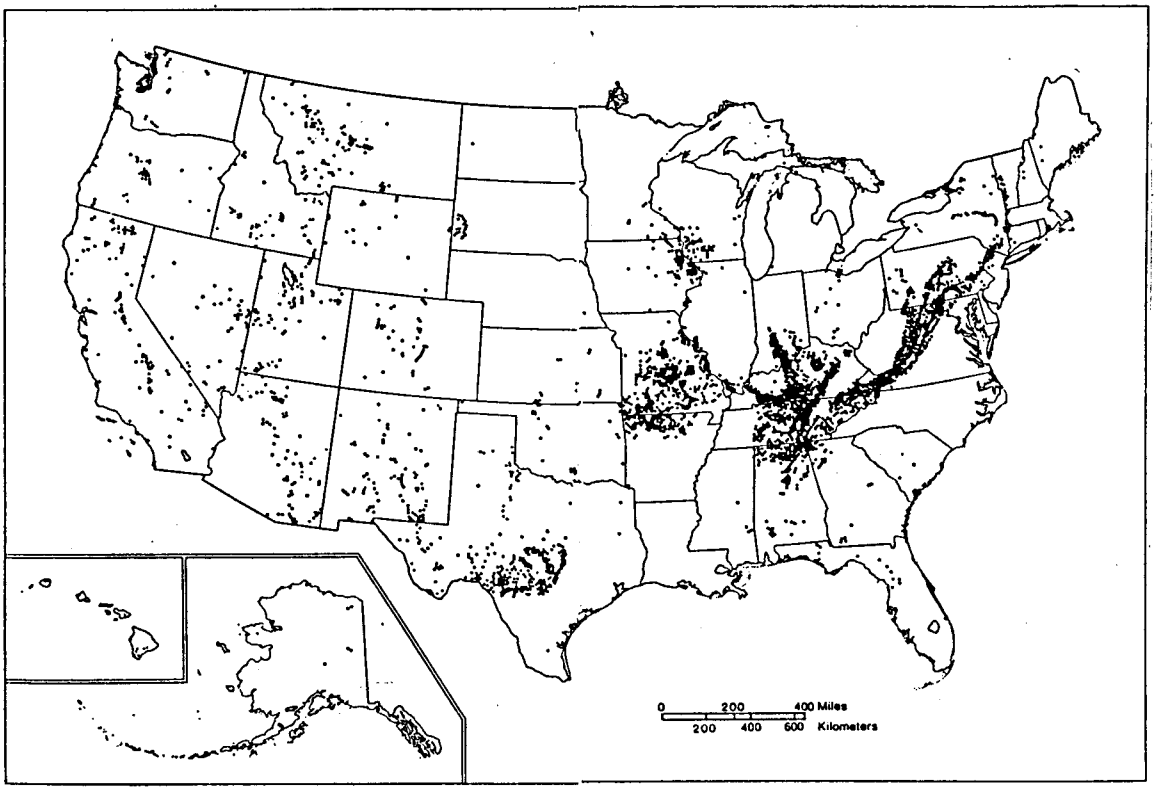

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